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Kampus Sungai Petani

Faculty of Administrative
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COFFEE CAPSULE VENDING MACHINE

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ABSTRACT
For a coffee lover, a coffee vending machine is one of the must-have-appliances that should be placed in the public area such as at shopping malls, offices, colleges, and other attractive spots. The machine is the new generation of vending machines that are widely used nowadays, where it is a self-service vending machine. Just follow a few simple steps, insert a coin, choose a flavor and you are done. But the existing vending machine lacks two-way communications especially between the machine itself and the machine's supplier. The suppliers do not have any information about the stocks left in the vending machine. Besides that, the machine user is also exposed to the non-hygienic environment when using the vending machine. The user indirectly needs to touch the vending machine to complete the process. The main objective of this project is to provide a substantial solution to the problems of manufacturing coffee capsule vending machines while keeping it at low costs. The coffee capsule vending machine can be accessed by the supplier using the Internet of Things (IOT) and Bluetooth modules (HC-05) which have been used for wireless communication between smartphone and machine. This machine is also incorporated with infrared sensors for obstacle detection. This project consists of two inputs: an IR sensor and push button and three outputs which are Bluetooth Module (HC05), LCD and servo motor. This Vending machine used Bluetooth module (HC05) as the IOT part. By utilizing the IOT, the information about the stock quantity available inside the machine can be easily obtained. In addition, with this new generation of vending machines it does not need any human interface for every transaction.

Keywords: IOT, Coffee capsule vending machine.

FLOW OF DESIGNING COFFEE CAPSULE VENDING MACHINE

This section describes the process of designing the circuit of the coffee capsule vending machine. The first step is to identify all components to be used for the machine. Next, the block diagram of the machine is illustrated to classify between input, output, and main controller of

the circuit. Next process is to design the circuit by using Proteus Software. The simulation procedure is run and tested until simulation is successful before hardware connection can be made.

Block Diagram of the Coffee Capsule Vending Machine

Block diagram of the coffee capsule vending machine as shown in Figure 1. The block diagram shows the overall components used for this project. There are expected to be two inputs and three outputs. IR Sensor and Push buttons are used as input parameters. Meanwhile for the outputs, RC SM-S4306R servo motors, and 16x2 LCD Display are used to indicate the current activity of the machine. Bluetooth Modules and Smartphones are used as the communication module.

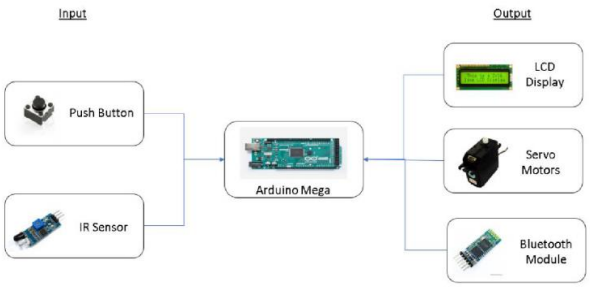


Figure 1. Block Diagram of the Coffee Capsule Vending Machine

Circuit Design of the Coffee Capsule Vending Machine

Circuit design of the Coffee Capsule Vending Machine as shown in Figure 2. The circuit is designed by using Proteus Software to enable project simulations and to write encodings before proceeding with project hardware connections. Proteus 8 Professional is used to illustrate the coffee capsule vending machine. The software is associated with detailed animation of components used to simulate the process of the coffee capsule vending machine.

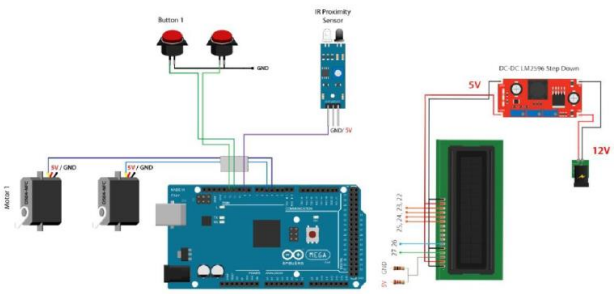


Figure 2. Circuit Design of the Coffee Capsule Vending Machine

PROCESS AND FINAL PROTOTYPE OF COFFEE CAPSULE VENDING MACHINE

This section describes the overall process and final prototype of the coffee capsule vending machine. The process will be illustrated by using a flow chart. The prototype is designed by using Adobe Photoshop CC software.

Flow Chart of the Coffee Capsule Vending Machine

The process starts when the switch is turned on and Arduino will trigger all pins, motor, IR sensors, LCD, and Bluetooth Modules. After the machine detects the presence of the coins, the list of coffee capsule flavors will be available for customers. Then, the machine lets customers select the type of coffee capsule flavors by pressing the available push button. The flow chart of the Coffee Capsule Vending Machine as illustrated in Figure 3.

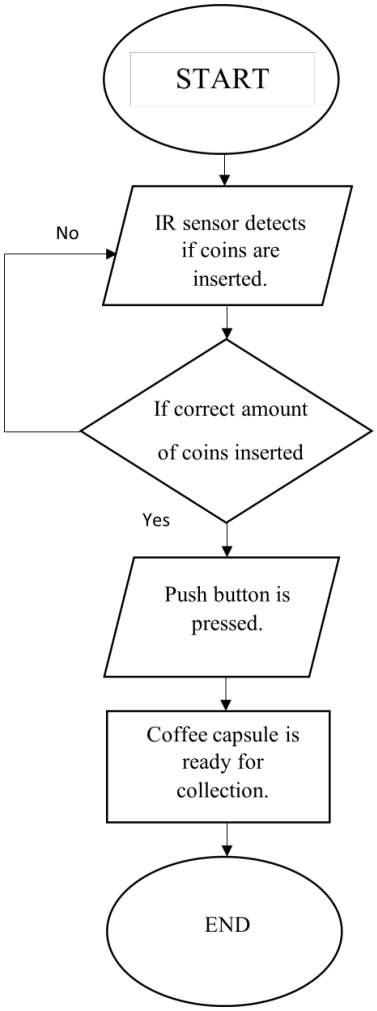


Figure 3. Flow chart of the Coffee Capsule Vending Machine

Prototype of the Coffee Capsule Vending Machine

The design and final prototype of the coffee capsule vending machine is shown in Figure 4a and Figure 4b, respectively. Firstly, the prototype is designed by using Adobe Photoshop CC software. Then, the final prototype is produced based on the design and it uses recycled materials to build the vending machine.

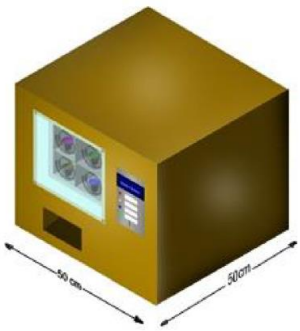


Figure 4a: Prototype of the Coffee Capsule Vending Machine



Figure 4b: Final Prototype of the Coffee Capsule Vending Machine

CONCLUSION

In conclusion, the Coffee Capsule Vending Machine is the new generation of vending machines that utilize the IOT as an interface between the machine and the user. The information about the quantity of the capsules available inside the machine can be obtained at fingertips. In a nutshell, the Coffee Capsule Vending Machine is the new plan to sell without human interface with low cost to build the project.

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